



## The Lyme Bay Experimental potting project - A short summary of *Cancer pagurus*



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Report to Devon and Severn IFCA

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## Executive summary

This report was requested by the Devon and Severn Inshore Fisheries and Conservation Authority (IFCA) to assess the recent increase in the Minimum Landing Size (MLS) of the brown crab (*Cancer pagurus*) from 140mm carapace width in females to 150mm and the effects of this on catch and landings. The report uses data collected as part of the ongoing Lyme Bay experimental potting project undertaken by the Marine Institute Plymouth University and funded by the Blue Marine Foundation. The data presented here is owned by the Lyme Bay Working Group as part of the Lyme Bay Fisheries and Conservation Reserve project facilitated by the Blue Marine Foundation.

In partnership with the Blue Marine Foundation, Plymouth University Marine Institute developed a 3 year experimental potting project to carry out an assessment of the impact of potting. The project introduced a gradient of potting intensity in experimental areas designated throughout the Lyme Bay Statutory Instrument (SI) in order to help detect any impacts of potting. In the context of this project, potting refers to the use of parlour pots targeting mainly brown crab (*Cancer pagurus*) and the European lobster (*Homarus gammarus*). Experimental treatment areas were introduced for each port, totalling in 16 areas across the MPA (Fig. 1). Each experimental area is 500m<sup>2</sup> x 500m<sup>2</sup>, located on mixed ground or rocky reef substrata within the boundaries of the MPA between depths of 25m – 31m. Quantitative experimental potting survey. A quantitative potting study is undertaken with the local fishermen to provide data on target species. This is undertaken seasonally in Spring (March), Summer (June), Autumn (September) and Winter (December) for a total of 3 years.

The project started in 2013 and was due to run until 2016, however disruption caused by severe weather over the Winter of 2013/2014 meant that the project needed to be extended.

For the purposes of analysis for this report, *Cancer pagurus* data has been extracted only. Seasonal data has been collated across multiple years for comparison. As the report has been commissioned by Devon and Severn IFCA to assess the effects of an increasing MLS, data from those ports affected has been extracted for analysis. This is data collected from the ports Axmouth and Beer.

A total of 2923 brown crab were used in analysis from a total of 6 sampling seasons consisting of 1642 female brown crab and 1281 males. 9% of the total females catch across all size classes falls between 141-149mm. This is the carapace width range that could previously be landed in the district but is now too small under the new MLS imposed by the Devon and Severn IFCA. The new increase in MLS will result in a reduction of 12% of overall marketable catch of the female brown crab, and 10% of overall marketable catch including males, for Lyme Bay fisheries that fall under Devon and Severn IFCA jurisdiction. It should be highlighted that this data is collected from experimental areas used for the project that experience a range of potting densities, including some areas that experience no potting effort. The severe winter storms of 2013/2014 may also have had an impact on brown crab and this may have had an influence the data collected in periods post storm. Ongoing data collection will increase resolution and our understanding of the brown crab populations in the Devon and Severn IFCA district in Lyme Bay.

## 1.0 Introduction

This report was requested by the Devon and Severn Inshore Fisheries and Conservation Authority (IFCA) to assess the recent increase in the Minimum Landing Size (MLS) of the brown crab (*Cancer pagurus*) from 140mm carapace width in females to 150mm and the effects of this on catch and landings. The report uses data collected as part of the ongoing Lyme Bay experimental potting project undertaken by the Marine Institute Plymouth University and funded by the Blue Marine Foundation. The impacts on the population of female brown crab as a result in the increased MLS are assessed.

**The data presented here is owned by the Lyme Bay Working Group as part of the Lyme Bay Fisheries and Conservation Reserve project facilitated by the Blue Marine Foundation. The report is for internal use only, any official use or publication must require the approval from the Working Group and the Author.**

### 1.1 Experimental potting project background

In July 2008, the UK Government (DEFRA) implemented a Statutory Instrument (SI), The Lyme Bay Designated Area (Fishing Restrictions) Order 2008, which closed a 206 km<sup>2</sup> area of Lyme Bay to bottom towed fishing gear. The objective of this implementation was to protect and recover the sensitive reefs habitats that were being damaged by bottom towed fishing activities, predominantly scallop dredging. A comprehensive study (MB0101 Marine Biodiversity R&D Programme) by Plymouth University Marine Institute (MI), the Marine Biological Association (MBA) and Plymouth Marine Laboratories (PML) commenced in 2008 in order to assess the ecological and socio-economic impacts of the SI (Attrill et al. 2011; Mangi et al. 2011). Static gear fishing (mainly potting), commercial scallop diving, recreational fishing and recreational diving activities have been permitted to continue inside the SI. Recently, concerns have been raised by local fishermen over significant increases in the level of potting activity within the SI. The ecological impacts of potting are not understood (Coleman *et al.* 2013; Eno *et al.* 1996, 2003). In partnership with the Blue Marine Foundation, Plymouth University Marine Institute developed a 3 year experimental potting project to carry out an assessment of the impact of potting. The project introduced a gradient of potting intensity in experimental areas designated throughout the Lyme Bay SI in order to help detect any impacts of potting. In the context of this project, potting refers to the use of parlour pots targeting mainly brown crab (*Cancer pagurus*) and the European lobster (*Homarus gammarus*).

In order to achieve suitable outcomes from the project, data on the impact of different densities of potting on the seabed, and in particular on populations of target species (brown crab and European lobster) are collected. To collect robust data comparing the impacts of different potting densities, four types of data are collected from the experimental areas in order to meet four sampling objectives.

- I. Towed underwater high definition (HD) video transect survey. Developed by the Plymouth University Marine Institute (Sheehan et al. 2010) to assess sessile and sedentary benthic fauna. This survey is undertaken annually during the summer period.
- II. Baited Remote Underwater Video (BRUV). BRUV surveys are used to obtain quantitative data on the mobile species. This survey is undertaken annually during the summer sampling period.

- III. Quantitative experimental potting survey. A quantitative potting study is undertaken with the local fishermen to provide data on target species. This is undertaken seasonally in Spring (March), Summer (June), Autumn (September) and Winter (December) for a total of 3 years.
- IV. Assessment of spillover. No potting control areas provide sites for assessing potential spillover of organisms inside the treatment areas to surrounding areas when there is no use of static gear.

For this report data collected for objective III will be used to assess any associated impacts on the population of brown crab from a rise in MLS from 140mm, carapace width, to 150mm in female crabs.

## 1.2 The brown crab (*Cancer pagurus*)

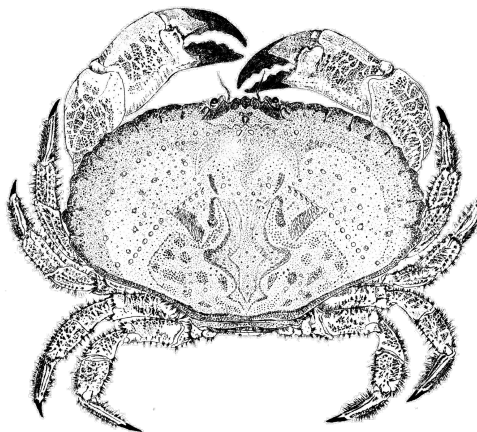


Image: [bidefordbuzz.org.uk](http://bidefordbuzz.org.uk)

This common decapod crustacean has a wide distribution around north-west Europe, and can be found around the entire coastline of Britain and Ireland recorded up to depths of up to 100m (Wilson 1999). The largest crab in the UK, these carrion scavenger species average 150mm (carapace width) however some individuals can grow up to 250mm (Neal and Wilson 2008). On average, brown crabs live around 20 years and typically reproductive maturity is reached after 10 years development (Wilson 1999). Male crabs become reproductively mature when carapace widths reach 110mm, while females develop slower as maturity is reached at when carapaces measure 127mm (Neal and Wilson 2008).

Brown crab reproduction takes place during the winter months, where male crabs copulate with a newly moulted receptive female. Eggs are laid in a pit dug by the female and fertilised eggs are then carried by the female for 7-8 months until hatching takes place (Fish and Fish 1989). Eggs are carried under the abdomen and egg bearing females are referred to as 'berried'. Up to 20 million larvae can be released, which are planktonic for an average of 30 days until settlement occurs in the intertidal zone (Neal and Wilson 1989). Development takes place in the intertidal zone until carapace length reaches 60-70mm (3 years) and then migration to the subtidal occurs for adult development (Wilson 1999). Like most crabs, growth occurs over a number of moult stages during which the existing exoskeleton is shed to allow a new, larger shell to harden (Keltz and Bailey 2010). Multiple conditions have to be optimal before an

individual enters into a moult phase, meaning growth rate can vary between 1-10mm a year depending on age, sex, water depth, water temperature and predation risk (Brown and Bennett 1980). Juvenile individuals can moult several times a year as growth is accelerated during this vulnerable period; however growth rates usually decrease with age where inter-moult phases can last up to 4 years (Keltz and Bailey 2010). Vulnerability is highest immediately after moult phases when crabs are often preyed upon by large fish, marine mammals and other conspecifics (Lawton 1989). As a result, brown crab are typically found on coarse, rocky, substrata where rocky ledges and boulders provide suitable protective habitat (Wilson 1999).

Studies have found that brown crabs can migrate up to 3 km a day, with some individuals covering 200 nautical miles (Pawson 1995). Cefas identified that female brown crab of the English Channel slowly migrate westwards, hypothesised as a strategy for releasing larvae into prevailing currents to ensure juveniles develop in similar nursery areas; less is known about the movements of males (Cefas 2011). Definitive winter migratory patterns of remain unknown, however many among the fishing community believe individuals move offshore to more stable waters to reproduce (Lyme Bay fishermen pers. comm).

This species is currently classified as 'not threatened' and has no dedicated conservation action. In the UK crab fisheries do not have total allowable catch or quota restrictions placed upon them. However it is illegal to land berried females in most UK and Ireland fisheries, many of which also enforce a MLS. The Lyme Bay fishery falls under the jurisdiction of two IFCAs, Southern IFCA and Devon & Severn IFCA. It is currently illegal to land any male or female under 140mm in Southern IFCA waters (Southern IFCA 2011). In Devon & Severn IFCA waters the landing of male brown crab under 160mm is illegal and the minimum landing size for female brown crab has recently been increased from 140mm to 150mm (Appendix 1).

### 1.3 Progress

The project started in 2013 and was due to run until 2016, however disruption caused by severe weather over the Winter of 2013/2014 meant that the project needed to be extended. Additional funding was received from DEFRA in order to extent the study into 2017 and allow multiple full sampling seasons. The project has currently completed 2013, 2014 and 2015 annual video sampling (I, II) and seasonal quantitative potting (III) up until Summer 2015. Spillover (IV) assessment is due to start in September 2015.

## 2.0 Methodology

The Lyme Bay MPA encompasses four fishing ports; Beer, Axmouth, Lyme Regis, West Bay. Static gear fishermen from each port helped designate four different experimental potting treatment areas: no potting (control), low density potting, medium density potting and high density potting.

Each set of four experimental treatment areas were introduced for each port, totalling in 16 areas across the MPA. Each experimental area is 500m<sup>2</sup> x 500m<sup>2</sup>, located on mixed ground or rocky reef substrata within the boundaries of the MPA between depths of 25m – 31m.

The potting densities of each treatment were determined by study coordinator from discussions with the fishermen:

- No potting control - 0 pots (per 0.5km<sup>2</sup>)
- Low potting - 5 - 10 pots (per 0.5km<sup>2</sup>)
- Medium potting - 15-25 pots (per 0.5km<sup>2</sup>)
- High potting - 30 pots and higher (per 0.5km<sup>2</sup>)

The high potting treatment denotes a level of potting that is substantially higher than the present level of potting. This is to replicate the effects of an increase in potting effort. Potting densities are maintained and monitored by the fishermen from each port as part of their daily fishing activities. The no potting control treatments are marked with a yellow A3 buoy on each corner to encourage compliance.

## 2.1 Data collection

A quantitative potting study is undertaken with the local fishermen to provide data on target species. Six strings of five standardised sets of pots (30 in total) have been constructed for each of the four ports and are used during the survey to sample each experimental area. Sampling occurs simultaneously between all four ports over a total of four consecutive days which standardises for physical factors. On day 1 all experimental pots are deployed in the first treatment for a 'soak time' of 24 hours. Pots are then hauled and all organisms caught are identified and biometrics, including carapace width, weight, sex and condition, are measured and recorded and individuals are then returned back to experimental areas. Quantitative potting is then continued until all four treatment areas for each port have been sampled. Sampling effort is therefore 120 pots per treatment, 480 pots per total seasonal sampling period. It is important to note that it is a legal requirement for pots to have escape hatches built in to individual pots in order to allow the escape of undersize juveniles; however for this survey IFCA dispensation has been granted to close escape hatches in order to capture all organisms across the entire age range of the population.

Data are collected on board by the scientists and the survey is completed every three months to account for annual changes in seasonality. Sampling occurs during Spring (March), Summer (June), Autumn (September) and Winter (December) for a total of 3 years (post storm).

## 2.2 Data analysis

For the purposes of analysis for this report, *Cancer pagurus* data has been extracted only. Seasonal data has been collated across multiple years for comparison. Due to the interruption to the project from the winter storms 2013/2014, Winter 2013 and Spring 2014 data could not be collected. Therefore following seasonal data comprises of data collected during the following years:

- Spring - 2013, 2015
- Summer - 2013, 2014, 2015
- Autumn - 2013, 2014
- Winter - 2014



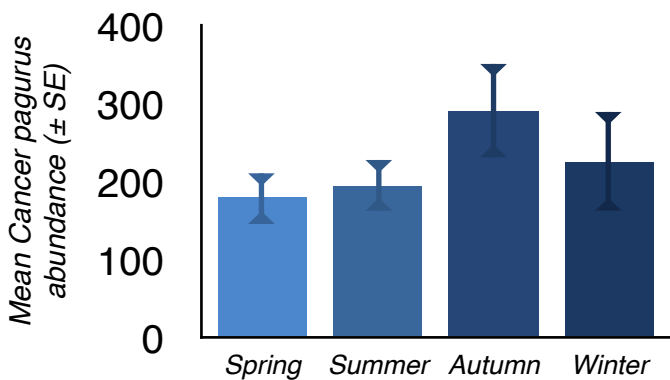
As the report has been commissioned by Devon and Severn IFCA to assess the effects of an increasing MLS, data from those ports affected has been extracted for analysis. This is data collected from the ports Axmouth and Beer.

The response variables of abundance, sex ratio and size class between seasons was looked at for this data set. In order to provide more in depth analysis on the impact of the MLS rise, female only data was then extracted and the response variables of abundance, sex ratio and size class were tested. A further subset was extracted for size classes that were considered marketable and size classes were again looked at.

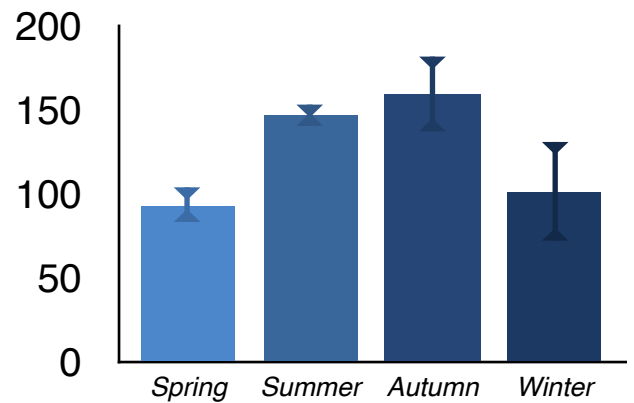
### 3.0 Results

A total of 2923 brown crab were used in analysis from a total of 6 sampling seasons consisting of 1642 female brown crab and 1281 males. These animals ranged in from 90mm - 222mm (155.012 ± 0.601) carapace width in females and 80mm-240mm in males (Mean 142.7 ± 0.689).

#### 3.1 Seasonal abundance



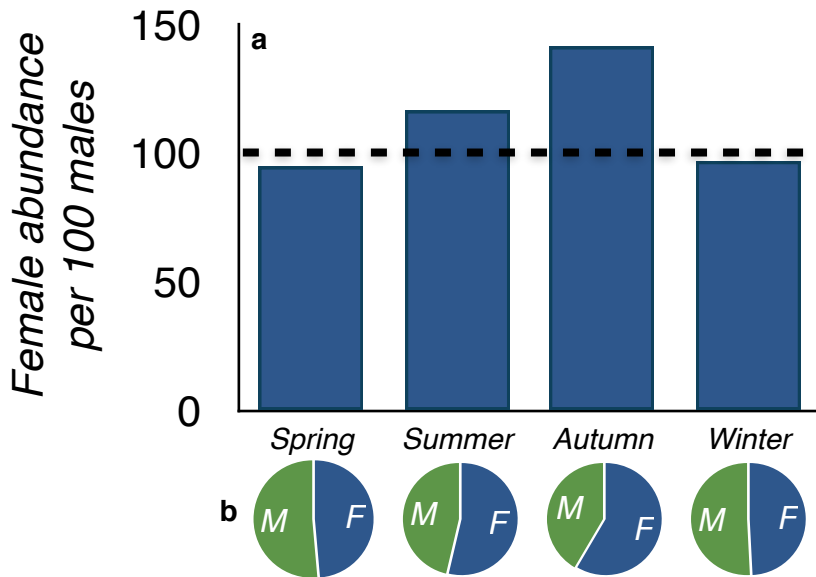
**Figure 1.** Mean overall abundance (± SE) of *Cancer pagurus* over season



**Figure 2.** Mean abundance (± SE) of female *Cancer pagurus* over season

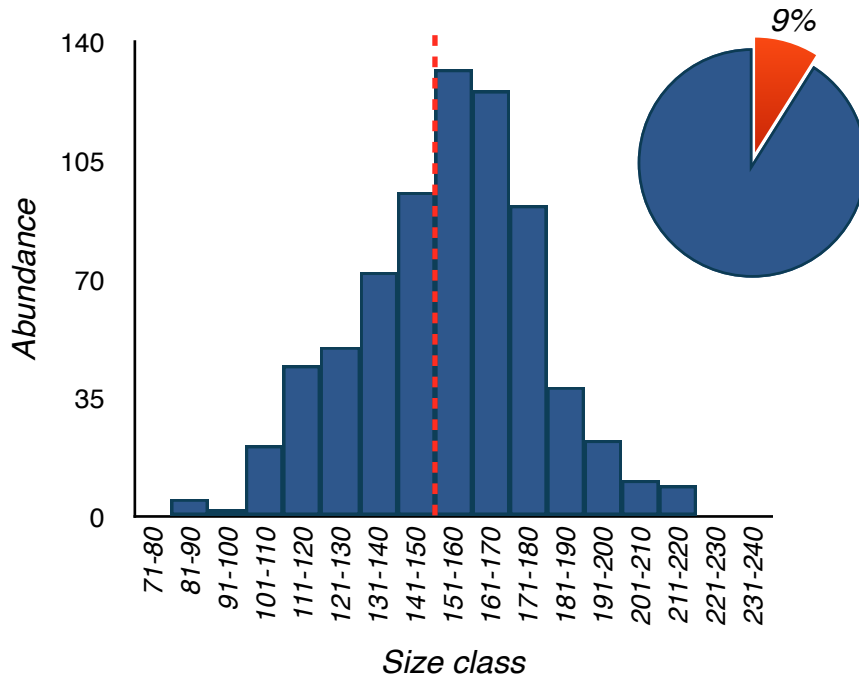
### 3.2 Sex ratios

Females had a higher ratio to males in both Summer (1:1.2) and Autumn (1:1.4).

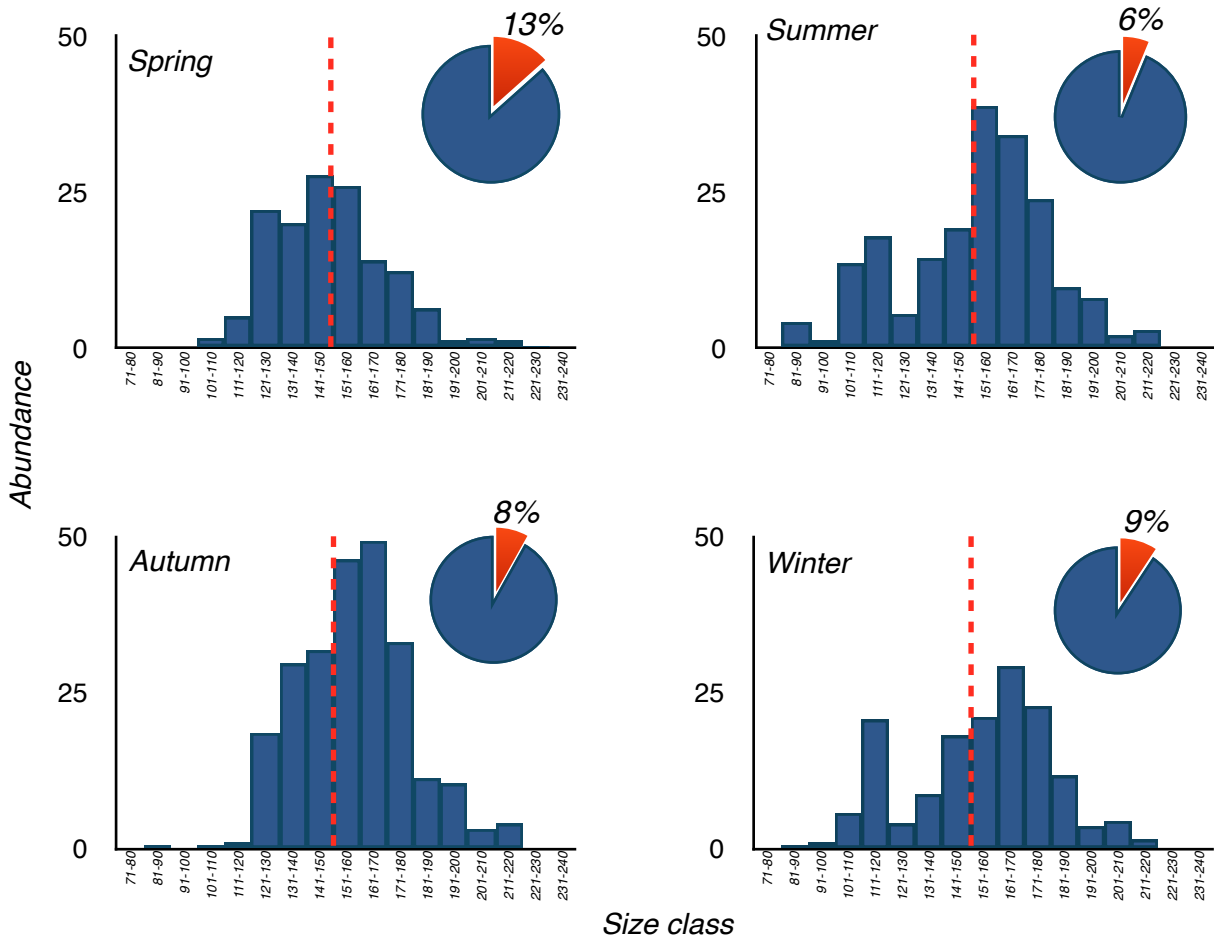


**Figure 3.** (a) Abundances of female *Cancer pagurus* per 100 males (---) in each season (b) Sex ratio by season

### 3.3 Size class

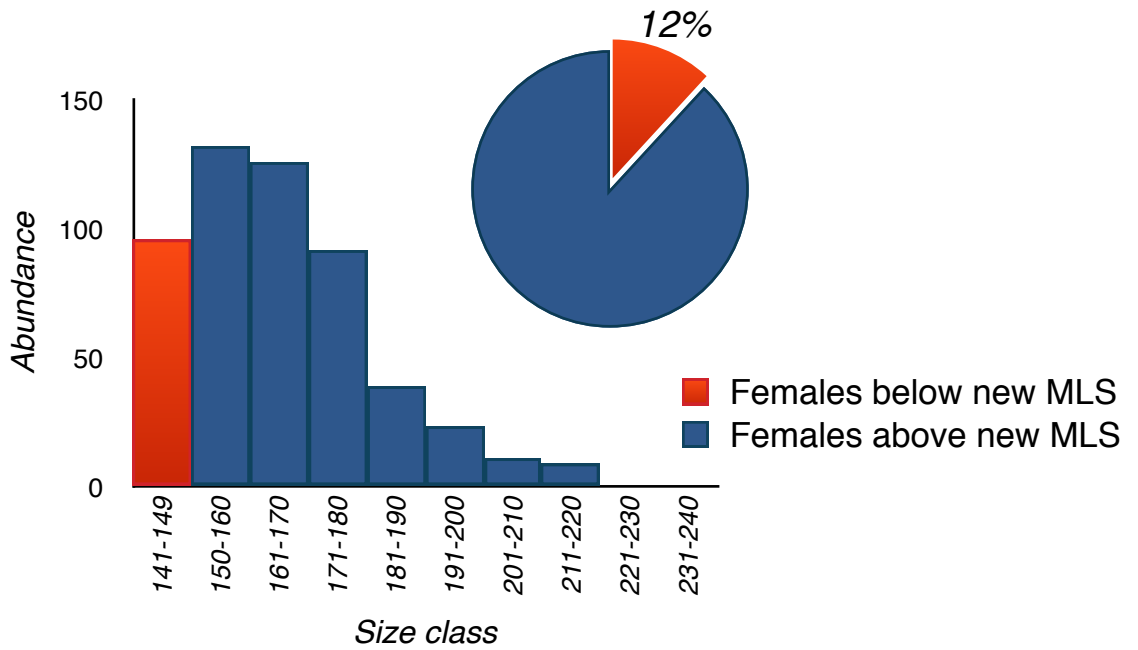


**Figure 4.** Abundance histogram for total *Cancer pagurus* population. Red line denotes new MLS. Pie chart for percent of catch affected by MLS increase.

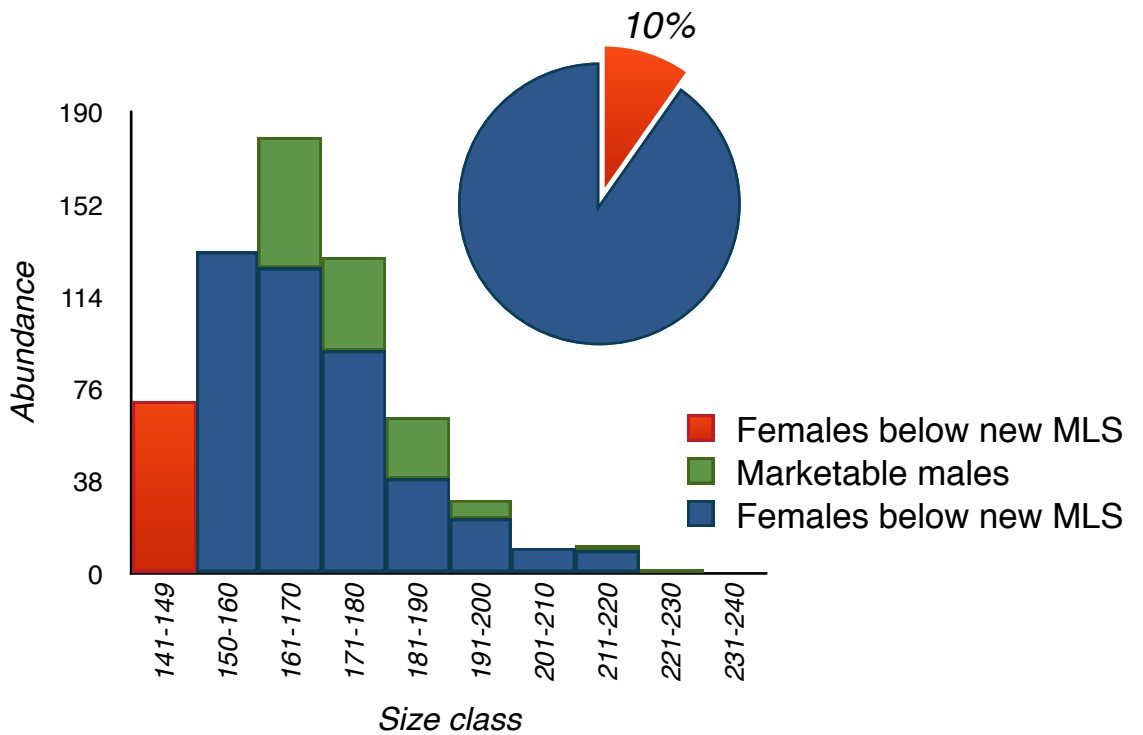


**Figure 5.** Abundance histograms of seasonal female *Cancer pagurus*. Red line denotes new MLS threshold. Pie charts for percentage of catch affected by MLS increase.

### 3.4 Size class (Marketable)



**Figure 7.** Abundance histogram with females below and above new MLS. Pie chart to show percentage of female catch affected.



**Figure 8.** Abundance histogram with females below and above new MLS, with additional marketable males abundance. Pie chart to show percentage of total catch affected.

### 4.0 Discussion

Collated seasonal data collected from 2013, 2014 and 2015 as part of the Lyme Bay experimental potting project has enabled preliminary analysis regarding the effects of the recently increased MLS from 140mm-150mm carapace width of female brown crab (*Cancer pagurus*). This has been based on data collected as part of the ongoing quantitative pot sampling that has been ongoing since 2013. Data presented here is based on 2923 crabs caught during 6 seasonal sampling periods during the project; an effort of 2880 individual pots. As expected, abundance increases from Spring onwards, peaks in the Autumn and decreases by Winter. This was the case for all crab caught, as well as just the female individuals (Figure 1,2). This follows normal population dynamics in brown crab species and other shellfish (Cefas 2011). Although the storm period interrupted sampling and reduced total sampling effort, it appears that the pattern of seasonal abundance has not been affected. It has been shown that this change in abundance is driven by the increase in females as well as the decrease in males seen particularly in Summer and Autumn seasons as the sex ratio of females to males increased during these periods (Figure 2).

Carapace width size class analysis reveals binomial abundance distribution across the complete size class which suggests normality and increases confidence in the data. The most abundant size of brown crabs fell between a carapace width of 151mm-160mm (Figure 4). Brown crabs of this size are considered reproductively mature and research suggests that crabs will under go 2 reproductive seasons before reaching this size (Bannister 1986; Brown crab working group 2009; Woolmer *et al.* 2013; Haig *et al.* 2015). It is worth noting the large decline in abundance in crab >180mm, this could be due to the fishing pressures faced by the population or an increase in mortality through senescence.

9% of the total catch across all size classes falls between 141-149mm (Figure 4). This is the carapace width range that could previously be landed in the district but is now too small under the new MLS imposed by the Devon and Severn IFCA. Seasonal analysis shows that the largest percentage of catch that will be impacted by the MLS increase will occur during Spring, however the overall abundance of crabs caught during this season is the lowest (Figure 5).

Further analysis of the percentage of marketable female catch was looked at by excluding all crabs with a carapace with under 140mm. When looking at the amount of landed marketable female crab removed due to the MLS increase, this makes up 12% (Figure 6). This is reduced to 10% when the whole marketable catch, including males, is considered (Figure 7).

## 5.0 Conclusions so far

The new increase in MLS will result in a reduction of 10% of overall catch of the brown crab (*Cancer pagurus*) for Lyme Bay fisheries that fall under Devon and Severn IFCA jurisdiction. This is based on the data collected throughout 6 sampling seasons over 3 years as part of the Lyme Bay experimental potting project. It should be highlighted that this data is collected from experimental areas used for the project that experience a range of potting densities, including some areas that experience no potting effort. Due to the timing of this report the data uses only one year of Winter data and that confidence in these findings will increase as the project continues through subsequent winters. The severe winter storms of 2013/2014 may also have had an impact on brown crab and this may have had an influence the data collected in periods post storm. Again ongoing data collection will increase resolution and our understanding of the brown crab populations in the Devon and Severn IFCA district in Lyme Bay.

## Acknowledgements

Thanks go to the Blue Marine Foundation and Plymouth University for support, local Lyme Bay fishermen involved in the project for their cooperation, Devon and Severn IFCA for all their help and support, DEFRA for funding extension.

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## Appendices

### Appendix 1. Devon and Severn IFCA Potting Permit Byelaw

Title: Devon and Severn IFCA Potting Permit Byelaw  
 IA No: IA No: D&SIFCA 002 Lead department or agency:  
 Devon and Severn Inshore Fisheries and Conservation Authority  
 Other departments or agencies:  
 Impact Assessment (IA)  
 Date: 10th December 2014  
 Stage: Confirmation  
 Source of intervention: Domestic  
 Type of measure: Secondary Legislation  
 Contact for enquiries:  
 M Mander  
 Deputy Chief Officer, D&S IFCA, m.mander@devonandsevernifca.gov.uk 01803 854648  
 RPC Opinion: N/A  
 Cost of Preferred (or more likely) Option  
 Total Net Present Value  
 £m1  
 Business Net Present  
 Value  
 £2  
 Net cost to business per year (EANCB on 2009 prices)  
 NA3  
 In scope of One- In, Two-Out?  
 Measure qualifies as  
 No  
 NA

What is the problem under consideration?

Potting is a key fishing activity undertaken by both the commercial and recreational sector in the District. Devon and Severn Inshore Fisheries and Conservation Authority (D&SIFCA) believes that the local, regulatory approach to managing some of the most important shellfisheries in the district needs to be improved to better reflect the different sectors' interests. There is no mechanism in place to restrict the fishing effort of non-commercial potting. Lack of reliable, relevant fisheries effort data, highlighted in this document, needs to be addressed. There is a lack of medium to long-term engagement with many of the fishers affected by the management measures. Currently the only opportunity for all those directly affected by the management measures is to engage in the consultation phase of byelaw making process.

Why is government intervention necessary?

In the 2011 Cefas reports it is stated that fishing pressure is such that the lobster4 and crab5 stock in the South West were believed to be at, or near to, maximum sustainable yield. While there is a lack of comprehensive data relating to shellfish taken by non commercial activities it is considered likely to be adding further pressure to these stocks.

Given this pressure and the evidentiary lacuna management intervention is required to redress market failure in the marine environment by implementing appropriate management measures (this Byelaw) to conserve features, to ensure negative externalities are reduced or suitably mitigated. Implementing this byelaw will support continued provision of public goods6 in the marine environment. D&SIFCA has a duty under section 153(1) of the Marine and Coastal Access Act 2009 (MaCAA) to manage the exploitation of sea fisheries resources in the district. Section 153(2) of MaCAA, sets out what steps it must take when carrying out its management duty

Summary: Intervention and Options

1 To be documented in £ms and calculated for 10 years from implementation of byelaw

2 To be documented in £ms and calculated for 10 years from implementation of byelaw – costs and benefits to business only. 3 As these IAs are not in scope of one in two out this does not need to be completed

4 <http://www.cefas.defra.gov.uk/media/580130/lobster%20south%20west%202011.pdf>

5 <http://www.cefas.defra.gov.uk/media/580170/crab%20western%20eastern%20channel%202011.pdf> 6 As defined on page 7 of the Impact Assessment

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What are the policy objectives and the intended effects?

- To introduce a flexible management approach.
- To introduce two types of permits for potting activity to differentiate between the needs of the commercial and recreational potting interests.
- To provide a mechanism by which stakeholders can actively influence the management of fisheries within the district.
- To produce legislation that is easily accessible and comprehensible and help make all fishers more aware of their responsibilities by making activity based byelaws.
- To achieve and support the sustainable exploitation of important shellfish stocks in the district.
- To introduce a byelaw that meets potential future needs with particular reference to required management for Marine Protected Areas (MPAs) in the district.
- To limit the need to use emergency byelaws.
- To provide the Authority with local potting effort data to improve future management decisions.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

0. Do nothing: option was considered inappropriate. D&SIFCA is required to review the byelaws that it inherited. Byelaws apply to all persons and as such represent the best legislative tool to manage coastal waters that are accessible to all fishers.

1. Create a potting permit byelaw introducing a flexible, adaptive approach to management.  
 2. Review and remake byelaws using current model leading to the creation of a rigid byelaws which are unsuited to dealing with future management needs.

3. Management of activity through Statutory Instruments or Defra fishing licence, similar to traditional byelaws, this approach to management is too rigid. It would also mean that D&SIFCA is not meeting its vision and Annual Plan commitments or its duties under s153 MaCAA.

4. Voluntary measures: due to the number of fishers affected by the management proposals it is unlikely that there will be sufficient voluntary compliance with the restrictive measures necessary to achieve the outcomes required by D&SIFCA.

All options are compared to Option 0, the preferred option is Option 1.

Permit conditions are to be reviewed no later than three years after the Byelaw comes into force and the Byelaw no later than five years after the Byelaw comes into force.

Will the policy be reviewed? Yes. If applicable, set review date:  
Does implementation go beyond minimum EU requirements?

No

Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.

Micro Yes

<20 Yes

Small Yes

Medium Yes

Large Yes

What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)

Traded: N/A

Non-traded: N/A

I have read the impact assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the Chair of D&SIFCA: Date:

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Summary: Analysis & Evidence Policy Option 1 Description:

FULL ECONOMIC ASSESSMENT

Price Base Year

PV Base Year

Time Period Years

107

Net Benefit (Present Value (PV) (£m8)

Low: Optional

High: Optional

Best Estimate:

COSTS (£m)

Total Transition9

(Constant Price) Years

Average Annual10

(excluding transition) (Constant Price)

Total Cost11

(Present Value)

Low

0.085

0.001

0.086

High

0.090

0.002

0.092

Best Estimate

0.085

0.001

0.086

Description and scale of key monetised costs by 'main affected groups'

The proposed permitting Byelaw would require all persons that use pots to operate under a permit issued by D&SIFCA. The biennial cost of a permit is set at £20. The cost of the permit is to cover estimated administration costs incurred by D&SIFCA. This does not cover the cost to D&SIFCA from resourcing the continual review of permit conditions.

D&SIFCA operates a risk based approach to enforcement. Enforcement of the new Byelaw will be met within the current budget. Operating on a fixed budget the Authority will continue its risk based approach to enforcement and consequently cover on other fishing activities may be reduced to meet the required enforcement of the Byelaw. It is envisaged that a greater enforcement presence will be required, at least initially, to support the new restrictions on non-commercial activities.

The budget for 2014/15 is £701,600 of which ~ 44% (£313,755) is provided as new burdens12 money from Defra. If budgetary pressures continue to rise, the enforcement and research work required to support this Byelaw maybe compromised.

D&SIFCA has commissioned a PhD student to assess the impact of potting on features within European Marine Sites (EMSs). The four year project is in its third year and will cost approximately £75,000 -£90,000 (excluding sea time on board D&SIFCA's survey vessel).

D&SIFCA are looking to introduce better ways of monitoring and control and believe that remotely accessed monitoring devices will play a key part in the future. Although not required initially, the Byelaw has the ability to require potting vessels to fit a remotely accessed monitoring device. This is most likely to be required if potting activities need to be spatially restricted to meet the conservation objectives of the Marine Protected Areas. Purchasing of units and installation of

7 The standard timeframe for analysis is 10 years unless the situation requires a different amount of time for example the benefits will occur over a much longer period. If there is deviation from the standard 10 years this must be clearly explained in the main evidence section.

8 Net Benefit - value of the total monetised benefits minus the total monetised costs. All monetised costs and benefits should be expressed in £m. In order to compare options you need to adjust the estimates by discounting the impacts to the same point in time, to estimate the Present Value (PV) of the impacts (see main evidence section for explanation).

9 Transient, or one-off costs or benefits that occur, which normally relate to the implementation of the measure. Non-quantified transient or one-off costs should be documented in the non-monetised section

10 Average Annual. These are the costs and benefits that will reoccur in every year while the policy measure remains in force (although the scale of the impact may change over time) and so should not include transition costs. These are expressed as an annual average (over the life of the policy), i.e. undiscounted.

11 i.e. discounted as with NPV

12 <http://archive.defra.gov.uk/foodfarm/fisheries/documents/fisheries/ifca-factsheet.pdf>

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units is likely to be approximately £1,000 with additional average airtime cost of between £150 and £200 per annum. It is envisaged that the specification of the units if required under the Byelaw will be compatible with units already required for towed gear vessels over 12m and under 15m in length. Commercial vessels should be able to access funding to assist with the purchase of the units. Funding of 40% has already been secured in advance of the requirement for vessels using mobile gear to operate LVMS.

Estimating the cost of communicating this change in management is difficult but will involve developing and siting signage at strategic locations throughout the district, formally advertising the Byelaw, placing of a press release with local media, information flyers and further development of the Authority's website. It is expected that the Byelaw will be confirmed during December 2014. The Byelaw will be in force on 1st March 2015 providing around a two months lead in period to publicise the new management approach. There will be a requirement to maintain and update the signage and website. The cost of the initial work is estimated at £10,000 and annual maintenance at £1,000. The funding for this work will be found from savings in the existing budget.

Other key non-monetised costs by 'main affected groups'

The introduction of the deeming clause in the Byelaw will lead to a small number of commercial vessels having to change their fishing pattern to remain compliant with local management measures. This change in operation has been discussed with fishermen from both North and South Devon but has not been fully evaluated. From the discussions, the impact on the larger vessels is not envisaged to be significant.

Persons fishing recreationally will need to adjust to having effort restrictions placed on their activities and will need to adjust to the catch and pot limitations.

D&SIFCA works closely with other organisations both research and enforcement to meet its duties. On enforcement work D&SIFCA issues warrants to all 13 EA fisheries enforcement officers including formally seconding two of these officers that work on the North coast on a part-time basis. D&SIFCA also has agreements with the EA to operate two of their vessels.

BENEFITS (£m)

Total Transition

(Constant Price) Years

Average Annual

(excl. Transition) (Constant Price)

Total Benefit

(Present Value)

Low

Optional

Optional

Optional

High

Optional

Optional

Optional

Optional

Best Estimate

Description and scale of key monetised benefits by 'main affected groups'

No monetised figures are available for the benefits of the recommended management approach. However significant potential benefits are described below.

Other key non-monetised benefits by 'main affected groups'

The new Byelaw better reflects the needs of the different sectors taking key shellfish resources by limiting the level of effort and the amount of shellfish that can be taken from the non-commercial sector. The Byelaw also allows for commercial effort to be restricted in a similar way. Reducing the competition from other sources will help to support the local shellfish retail economy in the district. Most inshore commercial vessel operators rely heavily on shellfish stocks to maintain a viable living from their profession.

At the same time the D&SIFCA believes that these catch limits on the non commercial sector are entirely reasonable and proportional to personal consumption and that both sectors will benefit

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from the sustainability of shellfish stock brought about by this Byelaw.

Operating the permit scheme will give D&SIFCA far greater knowledge of the level of potting occurring and the amount of shellfish being taken in the district to inform future management. The permit schemes will also allow D&SIFCA to communicate directly with users to increase understanding and awareness of the management but also allow permit holders to actively participate in shaping future management. This reflects strongly Government's Big Society and Localism agendas by encouraging local people to participate in the decision making process.

The Byelaw provides flexible spatial control of potting activity that was previously lacking. This measure maybe important to meet management recommendations following assessment of potting in MPAs. It allows for management to be introduced more quickly if protection from the activity is needed.

Marking of gear will be greatly improved. This will allow better monitoring of potting effort. It helps to ensure that recreational potting effort is effectively managed and helps prevent the tampering with or unauthorised use of other persons' gear.

The Byelaw is designed to be flexible enough to deal with future management needs within an appropriate timeframe. This in turn reduces the cost associated with developing, consulting and introducing new legislation.

Key assumptions/sensitivities/risks Discount rate (%)

Cefas reported in 2011 that the lobster13 and crab14 stock in the South West were believed to be at, or near to, maximum sustainable yield. The shellfish taken by non-commercial activities were not considered in the report but ipso facto can only add further pressure to these stocks.

The proposed byelaw would restrict non-commercial activities to a daily maximum catch that the D&SIFCA believes is entirely reasonable and proportional to personal consumption. This will help support Cefas' assessment of the stock and benefit both sectors by enhancing stock levels.



Initially there is a strong likelihood that there will be significant non-compliance with the new management measures. This will be through a combination of resistance to change, lack of awareness and a continuing will to profit from the illegal selling of shellfish.

Removal of new burdens money may lead to insufficient funding for D&SIFCA to successfully undertake its duties.

3.5%

USINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:

In scope of Measure qualifies OTO? as

N/A

Costs: N/A

Benefits: N/A

Net: N/A15

No

13 <http://www.cefas.defra.gov.uk/media/580130/lobster%20south%20west%202011.pdf>

14 <http://www.cefas.defra.gov.uk/media/580170/crab%20western%20eastern%20channel%202011.pdf> 15 Linked to ENCB

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Evidence base

1. Introduction

Inshore Fisheries and Conservation Authorities (IFCAs) have been established as the lead regulator for the sustainable management of inshore fisheries. As such, D&SIFCA is the most appropriate authority to implement, manage and enforce fisheries management measures within 6 nautical miles.

IFCAs have a nationally agreed high level objective of completing a review of all legacy byelaws by April 2015. As a result of the review, some byelaws will be remade, some will be amended, others will be amalgamated and those that are irrelevant or no longer needed will be revoked.

D&SIFCA believe that the review provides the opportunity to introduce a new approach to inshore fisheries and conservation management. Through permitting byelaws D&SIFCA will introduce greater flexibility in the way it manages the coastal and estuarine waters in the district. The marine environment is a dynamic system, there is high natural variation in some fish and shellfish stocks and fishing gear technology and practices continue to evolve. Inherited byelaws have been identified as being too rigid to fit this ever changing situation. Those affected by the new legislation will be safeguarded by the creation of an open and inclusive management review system. The Byelaw describes the process by which changes to permit conditions will be made.

One of the outcomes delivered by the new Byelaw will be the ability of D&SIFCA to collect detailed fishing data enabling it to understand more about potting in the district. Where good data is unavailable, the new Byelaw mitigates the risk of creating unintended consequences by having a flexible approach to management.

EMSs are designated to protect habitats and species in line with the EU Habitats Directive and Birds Directive. To bring fisheries into line with other activities, the Department for Environment, Food and Rural Affairs (Defra) announced on the 14th August 2012 a new approach to manage fishing activities within EMSs. This change in approach will promote sustainable fisheries while conserving the marine environment and resources, securing a sustainable future for both.

Defra produced a risk activity matrix and as a result D&SIFCA, as the competent authority, must assess identified fishing activities within EMSs by the end of 2016. The use of potting gear has been designated as a medium risk and assessment of the activity is already underway. The design of the new Byelaw allows for new management measures to be introduced in an appropriate timeframe if the need for these is identified through this assessment process.

The first tranche of Marine Conservation Zone (MCZs) were designated on 21st November 2013. Impacts from potting on the designated habitats is unlikely to be assessed immediately. However it is proposed in the new Byelaw to prohibit the removal of Spiny Lobster, a Feature of Conservation Importance, in two of the MCZs and to maintain other restrictions on potting currently in place within Lundy MCZ.

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2. Rationale for intervention

IFCAs have duties to ensure that fish stocks are exploited in a sustainable manner, and that any impacts from that exploitation in the marine environment, particular where protected by designation, are reduced or suitably mitigated, by implementing appropriate management measures (e.g. this Byelaw). Implementing this Byelaw will help ensure that fishing activities are conducted in a sustainable manner and that the marine environment is suitably protected.

Fishing activities can potentially cause negative outcomes as a result of 'market failures'. These failures can be described as:

Public goods and services – A number of goods and services provided by the marine environment such as biological diversity are 'public goods' (no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others). The characteristics of public goods, being available to all but belonging to no-one, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to under-protection/provision.

D&SIFCA must seek to ensure that the exploitation of sea fisheries resources is carried out in a sustainable way.

Negative externalities – Negative externalities occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. In many cases no monetary value is attached to the goods and services provided by the marine environment and this can lead to more damage occurring than would occur if the users had to pay the price of damage. Even for those marine harvestable goods that are traded (such as wild fish), market prices often do not reflect the full economic cost of the exploitation or of any damage caused to the environment by that exploitation.

D&SIFCA must seek to balance the social and economic benefits of exploiting the sea fisheries resources of the district with the need to protect the marine environment from, or promote the recovery from, the effect of such exploitation.

Common goods - A number of goods and services provided by the marine environment such as populations of wild fish are 'common goods' (no-one can be excluded from benefiting from those goods however consumption of the goods does diminish that available to others). The characteristics of common goods (being available but belonging to no-one, and of a diminishing quantity), mean that individuals do not necessarily have an individual economic incentive to ensure the long term existence of these goods which can lead, in fisheries terms, to potential overfishing. Furthermore, it is in the interest of each individual to catch as much as possible as quickly as possible so that competitors do not take all the benefits. This can lead to an inefficient amount of effort and unsustainable exploitation.

D&SIFCA must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district

In summary, the Byelaw aims to redress these sources of market failure in the marine environment through the following:

Management measures designed to conserve designated features of EMSs and MCZs will ensure negative externalities are reduced or suitably mitigated.

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Management measures will support continued existence of public goods in the marine environment, by controlling the catch taken.

Management measures will also support continued existence of common goods in the marine environment by reflecting the needs of the commercial and recreational sectors.

3. Policy objectives and intended effect

IFCAs were established under the MaCAA 2009 to lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry. It is intended that the Byelaw will support D&SIFCA by delivering the following objectives.

The Byelaw continues the process by which the Authority intends to replace all its inherited byelaws with activity based permit byelaws where possible.

The introduction of the Byelaw's permit conditions will enable D&SIFCA to flexibly manage fishing activity using a number of the measures summarised below;

catch restrictions,

gear restrictions and design,

spatial restrictions,

time restriction.

The Byelaw creates two categories of permits with differing management conditions designed to balance the needs of all users and to maintain a viable local commercial industry. D&SIFCA's guiding principles of the byelaw review include the aim to create a culture where the selling of fish or shellfish other than from commercial fishing activities is not acceptable to the general public.

The Byelaw creates a localised system of management by which those affected (permit holders) have a real opportunity to participate in continuing management decision making process. Permit holders will be contacted directly and provided with the information that underpins the proposed changes to permit conditions. Permit holders will be invited to comment on and suggest alternatives to the management proposals. This helps the permit holders to understand the reasons for the proposed changes and allows the permit holders to express their opinions more freely than is sometimes possible in public meetings.

D&SIFCA in turn is better informed and improves its decision making. Continued engagement with stakeholders reduces the likelihood that emergency measures (byelaw/ Statutory Instrument) need to be used to deal with unforeseen issues.

All the local restrictions applicable to potting activity can be found in one document. Permit conditions can be more readily translated into plain English helping the fisher to understand more easily fisheries legislation that is inherently complicated.

The Byelaw is designed to accommodate future management needs therefore reducing the cost associated with developing new legislation to deal with emerging issues.

In future D&SIFCA will be able to effectively collect relevant data to better inform its decision making through permit conditions.

4. Background

In 2013, the Authority formally consulted on the Potting and Shellfish Permit Byelaw. As a result of that process the Authority decided to split the two activities, potting and diving, and restructure the Byelaw to reflect lessons learnt from the successful introduction of the Mobile Fishing Permit Byelaw on 17th December 2013. The basic management intentions remain the same but are more targeted towards the specific user group and all management is now contained in the permit conditions making all the management measures easily reviewable and amendable. Any changes in permit conditions would have to follow the procedure outlined in the body of the byelaw, (Review of Flexible Permit Requirements) and in the process map (Annex A).

In addition to the requirement to review inherited byelaws, in August 2012 Defra undertook a review into the management of fisheries within EMSs. The review looked to identify future management measures required to ensure site features are maintained in a favourable condition. This resulted in a revised approach to management of fishing in EMSs.

The revised approach is being implemented using an evidence based, risk-prioritised, and phased basis. Risk prioritisation is informed by a matrix which categorises the risks from interactions between fishing activity and ecological features. Activity/feature interactions have been categorised as red, amber, green, or blue. Those classified as red have been prioritised for the implementation of management measures by the end of 2013 (regardless of the actual level of activity) to avoid the deterioration of Annex I features, in line with obligations under Article 6(2) of the Habitats Directive.

Interactions which are categorised as amber require a site-level assessment to determine whether management of an activity is required to protect features. Where there is doubt as to whether conservation objectives for a feature (or sub-feature) will be achieved because of its vulnerability to a type of fishing, in all EMSs where that feature occurs, the effect of that activity or activities on such features will need to be assessed in detail at a site specific level. Appropriate management action should then be taken based on that assessment.

Interactions which are categorised as green also require site-level assessment if there are "in-combination" effects. A categorisation of blue indicates that there is no feasible interaction, and as such no further assessment is required.

Paragraphs 6(1) and 6(2) of the Habitats Directive require that, within Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), member states:

establish the necessary conservation measures which correspond to the ecological requirements of the Annex I natural habitat types and the Annex II species present on the sites;

take appropriate steps to avoid the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated.

16 Fisheries in EMS policy document: [www.marinemangement.org.uk/protecting/conservation/documents/ems\\_fisheries/policy\\_and\\_delivery.pdf](http://www.marinemangement.org.uk/protecting/conservation/documents/ems_fisheries/policy_and_delivery.pdf) 17 See Matrix: [www.marinemangement.org.uk/protecting/conservation/documents/ems\\_fisheries/populated\\_matrix3.xls](http://www.marinemangement.org.uk/protecting/conservation/documents/ems_fisheries/populated_matrix3.xls)

18 Centre for Environment, Fisheries and Aquaculture Science (CEFAS) review of matrix and supporting evidence: [http://www.marinemangement.org.uk/protecting/conservation/documents/ems\\_fisheries/cefas\\_matrix\\_review.pdf](http://www.marinemangement.org.uk/protecting/conservation/documents/ems_fisheries/cefas_matrix_review.pdf)

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Regulation 8(1) of the Conservation of Habitats and Species Regulations 2010 defines an EMS as any (among others) SAC, SPA and SCI. Part 6 of these regulations lay out the management requirements for EMSs, in line with articles 6(2), 6(3) and 6(4) of the Habitats Directive.

Potting activity on designated features within the EMSs in D&SIFCA's district have been categorised as amber. D&SIFCA has identified potting as a 'high priority amber' due to the known high levels of potting activity (if not entirely accurately quantified at present). D&SIFCA's assessment of the activity is planned for 2014-16.

The byelaw will apply to the whole of the D&SIFCA district although potting is limited generally to the north and south coasts of Devon.

Environmental Impact

Impacts of potting gear on reef features designated under MPAs

It is due to the uncertainties of the impacts of potting on reef features in the EMSs that the activity is categorised as amber. D&SIFCA has commissioned a PhD student to assess the impact of potting on features within EMSs. The four year project is presently in its third year and will cost approximately £75,000 (excluding sea time on board D&SIFCA's survey vessel).

Cefas reported in 2011 that the crab and lobster stocks were believed to be at, or close to, maximum sustainable yield. The permit conditions can restrict the effort of both commercial and recreational potters.

D&SIFCA has also embarked on a survey with all commercial potting and netting operators to get a better understanding of the level of potting activity throughout the district and has asked, among other things, whether commercial operators believe that potting effort should be restricted.

There are a number of sectors affected by this proposal specifically:

Fishing Sector:

From MMO and D&SIFCA records it is believed that up to 400 commercial fishing vessels may be potting in the district. The level of recreational potting is far more difficult to quantify as similar records are not available but best current estimate is that between 100-150 vessels may be participating in the fishery.

Any person using pots within the D&SIFCA district will be affected as they would need to operate under a permit byelaw. The requirement to have a permit will start to remove the uncertainties in quantifying the levels of potting activity, thus better informing the decision making process.

Local economies and society:

Public awareness of the importance of the potting sector and how it operates will improve through the introduction of the Byelaw.

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One of D&SIFCA's guiding principles of the byelaw review includes the aim to create a culture where the selling of fish or shellfish other than from commercial fishing activities is not acceptable to the general public.

Supporting the local commercial potting sector in turn supports local tourism. Both fishing and tourism are key sectors of the economy in D&SIFCA district.

Enforcement bodies:

The lead responsibility for enforcing any measures in the area would fall to D&SIFCA and therefore the additional enforcement cost would impact on D&SIFCA.

The Authority recognises that it has a duty to ensure that the legislation it introduces is enforceable. The Authority operates a risk based approach to enforcement. The byelaw is designed (including deeming clause), in part, to make enforcement of the management measures more effective. Using information provided by potters or members of the public (an out office number is available 07740 175479 to report any suspicious fishing activity) the Authority will undertake planned enforcement operations.

The options

In determining the most appropriate form of management following the better Regulation Principles<sup>19</sup>, D&SIFCA must consider voluntary measures before proceeding with a statutory measure such as a byelaw<sup>20</sup>.

Option 0: 'Do Nothing'

The fishing pressure from potting effort in the district is believed to be such that not regulating the activity would lead to unacceptable risk of the important shellfisheries being over exploited and collapsing.

Recommended option

Option 1 A D&SIFCA 'Potting permit byelaw'.

The recommended option reflects D&SIFCA's aim to introduce a new approach to inshore fisheries and conservation management. The permitting byelaw will encourage active participation in management decisions.

This option is recommended because D&SIFCA is viewed as the appropriate statutory organisation to lead on the sustainable management of inshore fisheries and protection of the marine environment. A permitting byelaw is the preferred approach due to the flexibility associated with permit conditions.

There is also the potential for further measures to be introduced speedily to regulate catch restrictions and reporting, gear construction, spatial and time restrictions and the fitting of specified equipment to vessels.

<sup>19</sup> Link to BRPs <https://www.gov.uk/government/publications/better-regulation-framework-manual>

<sup>20</sup> This is only the case if voluntary measures are cheaper than other options. A full description of the voluntary measures envisaged and how effective these will be in terms of risk mitigation.

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This option mitigates the risk of imposing inappropriate permanent restrictions based on limited available evidence. Management is required for the reasons set out in the IA but care should be taken to ensure decisions are reversible in light of better evidence or changing circumstances in an appropriate timeframe.

The ability to change management requirements though varying permit conditions is likely to be less expensive than creating separate voluntary agreements. Where voluntary agreements are created by other initiatives D&SIFCA has the ability to support the management approach by introducing permit conditions if required. Fishermen working with Blue Marine Foundation have developed a code of practice in Lyme Bay for static gear activities and have called on the IFCA's to bring in management measures to support the agreement.

Option 2 D&SIFCA to revoke byelaws and create individual byelaws

This option would involve remaking byelaws using the traditional, inherited model, leading

to the continuation of a management approach that is less able to adapt to change.

Under this option should further measures be required in the future for potting and shellfish management then a new byelaw would be required or the existing Byelaw would have to be amended. The byelaw making process is expensive and time consuming. More importantly the need to formally consult on any new byelaw will lead to extended periods of time where the management approach is not fit for purpose.

Option 3 MMO management measure – permanent byelaw or fishing licence condition

IFCA's have been established as the responsible lead statutory organisation for the sustainable management of inshore fisheries and conservation. D&SIFCA's structure is in recognition of the role it has in dealing with fisheries and conservation management at a local level. D&SIFCA intends to work closely with the MMO and adjacent IFCA's so that where possible management is consistent across the South West and between organisations.

Option 4 Voluntary agreement

D&SIFCA has considered this option in light of Better Regulation Principles. However, due to the recorded non-compliance with existing legislation, the incentive to catch and sell high value shellfish, the number of fishers, the area of sea and the length of coastline within D&SIFCA district, it is believed that a voluntary agreement would be poorly adhered to and poses an unacceptable risk to the fisheries and possibly the wider environment.

If a voluntary approach was adopted for the recreational sector some of the issues set out above would equally apply. A code of conduct approach would not dissuade some recreational potters to refrain from their current catching practices which are in conflict with the Authority's opinion of what a recreational activity should be.

In addition the Authority would be unlikely to obtain the same level of data from this sector than can be achieved by the permitting approach. The permitting approach also creates direct communication links with fishers actively undertaking the activity. Through better communication the Authority and the permit holder will improve their understanding of the potting sector and provides an opportunity for both sectors to be properly represented in the Authority's management decisions.

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Analysis of costs and benefits

The analysis of costs and benefits is based on comparing Option 1 to Option 0. The Authority accepts that precise data is not available for all aspects of the management covered by the Byelaw and in such circumstances the Authority has proceeded on the best available evidence and has applied the precautionary principle where data is unavailable. The Authority is entitled to proceed upon this evidentiary and precautionary basis. The Byelaw provides the opportunity to introduce a mechanism to gather more precise evidence to inform future management decisions by requiring all permit holders to provide records of their fishing activity. This requirement is set out in the Byelaw in, paragraph 17 'The permit holder shall provide any relevant fisheries information required by the Authority for the discharge of its functions'. The Authority is mindful of the fact that, where possible, as increased survey data and user evidence becomes available the permitting system will provide a flexible and responsive mechanism for timely adjustments to be made in the light of this increased evidence base. This could include a revision upwards in the catch limitations if the evidence justifies such an adjustment.

The Authority's management approach is to encourage fishers to participate in the management of the fisheries. The management of the fishery should benefit from the experiences of the fishers. It also means that management can be innovative and explore different ways of working.

Information used in this section has been taken from:

<sup>21</sup> The responses received to the formal consultation on D&SIFCA's Potting and Shellfish Permit Byelaw July-August 2013.

<sup>22</sup> Meetings with commercial fishermen during the consultation on D&SIFCA's Potting and Shellfish Permit Byelaw.

<sup>23</sup> Vessel data from MMO and D&SIFCA records.

<sup>24</sup> D&SIFCA's Members and Officers' knowledge and expertise.

<sup>25</sup> D&SIFCA's Potting and Netting questionnaire with commercial vessels.

<sup>26</sup> The responses received to the formal consultation of the Potting Permit Byelaw Oct –

Nov2014.

Analysis of fisheries costs

All persons fishing with pots in the district will require a permit issued under the byelaw. MMO and D&SIFCA records would indicate that up to 400 commercial vessels may be potting in the district at any one time. The number of recreational potters is unknown but it is estimated that there may be in the region of 100-150 vessels. One of the immediate benefits of introducing the permits scheme is that the numbers of fishers using pots becomes more readily identifiable. This will better inform the management decision making process.

Although the Authority has the ability to restrict the number of permits issued this is not the way that it believes effort should be restricted and the number of permits issued will be unlimited.

Permits

Fishing effort management by way of licences is already undertaken at a national level. Local restricted licencing permit schemes can bring additional benefits to those fishers within the scheme, such as greater access to stock, limited competition from other fishers, an

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increased sense of ownership and reward for adopting good fishing practices. Many contributors<sup>21</sup> to the fisheries management debate support the use of such an approach. However among the many risks it is highly likely that a restrictive permit scheme becomes a valuable, tradeable document (even when every action is taken to prevent this from happening), it limits opportunity for new entrants to the fishery and may lead to increased effort as fishers believe that a track record of fishing may qualify them for a permit in the first instance. A restrictive scheme would also significantly increase the administrative burden on the Authority, the current budget and staff resource would not be able to deliver this approach.

The cost of the permit will be £20 and will be valid for a maximum of 24 months. The cost of the permit is set out in the Byelaw and can only change when the Byelaw is reviewed. The charge is based solely upon the estimated administrative cost in terms of staff hours. Inevitably this means that the same hours are incurred irrespective of whether the applicant is a commercial or recreational user. However to reflect the requirement for recreational fishers to attach tags to their pots the initial charge for tags (up to five per permit holder) will be met by the Authority.

D&SIFCA believes that a charge of £20 for up to a two year permit, where the conditions of use may be varied without cost to the permit holders during that period, does not impose an excessive financial or regulatory burden upon any of its stakeholders. In addition the value of the shellfish (maximum amount) that can be removed in one day would easily exceed the cost of the permit.

Deeming

The deeming clause will potentially affect persons that fish both inside and outside the district. Through discussions with representatives of the commercial fleet in north and south Devon the number of vessels affected is likely to be low. Nevertheless fishermen from Ilfracombe felt that the deeming clause may affect their autumn offshore lobster fishery where a significant proportion of the catch is berried. Vessels fish pots inside and outside of the district during this period of the year. Recognising this fishing pattern, the deeming clause does not prevent the carriage of the catch caught offshore through the district. The deeming clause sets out that whilst a vessel is engaged in the act of fishing<sup>22</sup> in the district the catch on board is deemed to have been caught in the area. For example this still allows fishermen to fish inside the district and then outside the district and retain on board berried lobster if they then transit through the district to land. However if a vessel fishes outside of the district and catches berried lobsters and then engages in fishing inside the district those berried lobsters will be deemed to have been caught in the district if inspected at sea.

Byelaws only apply within the district, normally six nautical miles from the coast or in places on the north coast of the D&SIFCA district, the median line with Wales. Proving where vessels have been fishing is an inherent and significant weakness of byelaws. It reduces the ability to enforce the legislation and consequently the effectiveness of the management measures. The deeming clause goes a significant way in addressing this weakness. It is incumbent on D&SIFCA to support the majority of law abiding fishers (example supporting the measure to return berried lobsters) to introduce effective and enforceable legislation.

<sup>21</sup> Including Stage Two Report of Project Inshore, [http://www.seafish.org/media/921067/2013.07.23\\_project\\_inshore\\_s2\\_v5.pdf](http://www.seafish.org/media/921067/2013.07.23_project_inshore_s2_v5.pdf) <sup>22</sup> Fishing as defined in the D&SIFCA Potting Byelaw

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Catch Restrictions

All potters, except persons operating with shellfish entitlements on the vessel's general commercial licence, will be restricted in the number of shellfish that can be caught in any one calendar day. The Byelaw provides the mechanism by which commercial operators could be restricted by the Authority but this is likely to be in support of national or European initiatives.

Nationally, commercial vessels, using pots or nets, that do not have shellfish entitlements are restricted to a maximum of five lobsters and 25 crabs per calendar day. All five objections received to the formal consultation of this Byelaw claimed that the Byelaw was disproportionate in that the Authority was only imposing catch and gear restrictions on the recreational sector in the first instance. To reflect these concerns the same restrictions, five lobsters and 25 crabs per calendar day will apply through the permit conditions to this sector of the commercial potting fleet. The additional benefit of this approach is that this catch limit for these commercial vessels is directly enforceable by the Authority's enforcement officers.

The Byelaw restricts the daily catch of recreational potters to two lobsters and three crabs per calendar day per person. The Authority believes it has achieved a fair balance between the divergent interests of commercial and recreational fishers. Different groups of fishers raise different management challenges. Treating these groups differently is not adverse discrimination. Rather it simply reflects these different management challenges present and the differing motivations and intentions of these groups. For non-commercial fishers the Authority believes that it has set limits which are reasonable and appropriate to personal consumption.

The daily limit on the number of lobsters taken was increased following D&SIFCA's considerations of the 14 objections received during the consultation on the Potting and Shellfish Permit Byelaw. Two of the objections received referred to the restrictions being placed on hand gathering of shellfish at low water. The Byelaw does not include such activities. It is proposed that intertidal hand gathering activities will be considered by D&SIFCA at a later stage.

Applying bag limits to persons undertaking a recreational activity is not setting a new precedent. Other IFCA's have inherited byelaws that contain catch restrictions and these are summarised in Annex B. At a national level in Northern Ireland catch and gear restrictions have been applied to recreational potters<sup>23</sup>

Minimum sizes of a number of key shellfish are included in the permit conditions. Although minimum sizes do not change frequently, having that ability to change restrictions is important. D&SIFCA have undertaken a year long study to assess the size at which whelks reach sexual maturity. D&SIFCA are considering increase the minimum size following the research and whether to introduce a minimum width for this species rather than a minimum length. D&SIFCA also propose to increase the minimum size of female edible crab to 150mm in line with Cornwall IFCA. Discussions with the commercial fleet on the south coast of Devon would indicate widespread support for the increase in the minimum size of edible crab. D&SIFCA also propose to increase female spider crab to 130mm and spiny lobsters from 95mm to 110mm in line with Cornwall IFCA's restriction. Consistency of management is another of D&SIFCA's guiding principles of its review of the inherited byelaws.

23 The Unlicensed Fishing for Crabs and Lobster Regulations (Northern Ireland) 2008

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Spiny lobsters are a Feature of Conservation Importance in two designated MCZs within the D&SIFCA district. The number of spiny lobsters reported caught in the Lundy MCZ and the Skerries and Surrounds MCZ by commercial potters is very low. The total number of commercial boats working in the two MCZs is believed to be 15. Although the commercial value of spiny lobsters is high, ranging between £40 and £60 per fish the number caught would suggest that by prohibiting the removal of spiny lobsters from these two areas is likely to cost the whole fleet around £1,500. The low capture rates are likely to be indicative of very low populations in the two MCZs so the removal of only a few individuals may have a significant impact on the stock.

The byelaw prohibits the use of edible crab as bait whilst targeting crab and lobster. Although edible crab is used elsewhere in the country to target lobster it is thought to be used on a very small scale currently within the district. At this stage insufficient information is available to fully assess the implications for the whelk fishery if the ban on the use of edible crab as bait was extended. During consultation on the Potting and Shellfish Byelaw, fishermen from North Devon expressed considerable concern if this measure was introduced. However all edible crab used as bait must meet the minimum sizes that apply in the district.

This may restrict where fishermen source bait from as other areas have smaller minimum sizes but it also prevents fishermen taking undersize crab from any fishery within the district and having the defence that the bait has been bought in. This approach should help to satisfy a significant proportion of commercial crab and lobster fishers that would like to see the complete ban on the use of edible crab as bait.

The flexibility in controlling the use of bait means that species could be added in support of developing the recreational sea angling sector if deemed appropriate at a later stage.

Gear restrictions

The Byelaw continues the use of escape gaps in parlour pots and other pot designs that have 'soft eye'24 entrances. Since the introduction of the escape gap restriction, commercial fishermen have generally supported the measure as the escape gap lets juvenile crab and lobster leave the pot and prevents damage to undersize shellfish through fighting with larger individuals. The measure also reduces the time needed by the fishermen to clear the pots of undersize shellfish. One of the unintended consequences of the escape gap legislation was to remove the ability of pots with soft eyes to effectively target the velvet crab fishery. Although not a large fishery the fishery would help support a number of the small inshore vessels during the early spring months when edible crab and particularly lobster are not active on the ground due to the reduced water temperature. Consultation on the proposal to relax the requirement for escape gaps during January, February and March will be undertaken with the commercial sector.

The Byelaw prohibits the use of store pots by recreational potters. This measure helps significantly with the ability to enforce the daily catch restrictions. Similarly, commercial operators operating without a shellfish fishing entitlement need to apply for a dispensation from the MMO if they wish to store pot their catch.

The proposal is to limit the number of pots operated by the recreational sector to five per permit issued. A number of the objections to the Potting and Shellfish Permit Byelaw believed that the limit on the number of pots was too low. D&SIFCA's Byelaw and Permitting

24 'soft eye' as defined in the permit conditions of the draft D&SIFCA Potting Byelaw

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Sub-Committee considered increasing the limit to ten but on balance decided to maintain the level at five in the first instance.

The Byelaw provides the mechanism by which commercial operators could be restricted by the Authority. As part of the current potting and netting questionnaire commercial fishermen are asked for their views on whether a restriction on the number of pots operated by them is needed.

Surface markers, buoys or dhans, attached to potting gear need to be marked with either the commercial vessels' Port Letters and Numbers or the permit number. This will assist greatly in monitoring of fishing activity and help identify persons responsible for the gear. Determining ownership of gear is difficult at present and has resulted in seized gear relating to minor offences being sold rather than being returned where the owner has not come forward. Better marking of gear will also help when members of the public report suspicious activity in relation to static gear. Commonly potting gear is mistaken for nets. In the case of recreational gear, in addition to the requirement to mark gear, each pot needs to be tagged with tags issued by D&SIFCA. In the first instance up to five tags will be issued for free to the permit holder. The use of tags will enable the restriction on pot numbers to be enforced.

5. One In Two Out (OITO)

OITO is not applicable for byelaws as they are local government byelaws introducing local regulation and therefore not subject to central government processes.

However the new Byelaw will replace two inherited byelaws that relate to potting and shellfish. The Byelaw will also introduce new restrictions on unlicensed, non-commercial fishing activities. These additional restrictions are important for D&SIFCA to meet its duties under section 153 (2) of the Marine and Coastal Access Act 2009.

6. Small firms impact test and competition assessment

The proposals will benefit the commercial fishing sector by reducing the amount of shellfish finding its way into the market from unlicensed vessel activities. Although it is impossible to determine the scale of the issue, commercial fishermen operating small boats believe it poses a significant threat to their small businesses.

Small businesses' ability to innovate may no longer be restricted due to rigid fisheries legislation. For example the escape gap restriction may be adapted to reflect seasonal opportunities for small businesses to exploit the velvet crab fishery.

No fishers are exempt from this Byelaw as it applies to all persons operating pots.

7. Conclusion

The D&SIFCA has statutory responsibilities that it believes it meets by introducing the Potting Permit Byelaw.

The Byelaw is designed to meet the Authority's conservation responsibilities but at the same time minimising the socio-economic impact from these restrictions. The Byelaw also provides the flexibility to manage fishing activities in a timely, effective way and

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provides the framework to consider developing new fisheries. The approach removes the need for further byelaws to deal with potting management and as such delivers significant saving to the public purse.

The purpose of this Byelaw is to provide the Authority with the ability to balance the differing needs of persons using pots and taking shellfish. The Byelaw will provide the ability to manage effort directed towards the shellfisheries and support the development of sustainable fisheries.

All persons, other than those operating registered fishing vessel with a shellfish fishing entitlement, set out in section 3 of the vessel's general fishing licence, will be limited to a daily catch limit of certain species. A post implementation review will be undertaken no later than five years after the Byelaw is confirmed. It is the Authority's intention to review the management measures contained in the flexible permit conditions annually. It is possible that flexible permit conditions can be reviewed more frequently if needed and sufficient data is available. Social and economic data will be considered along with other evidence when considering if changes should be made. An impact assessment will be undertaken if management changes are proposed.

The permit scheme allows D&SIFCA to communicate directly with users to increase understanding and awareness of the management but also allows permit holders to actively participate in shaping future management. This reflects strongly Government's Big Society and Localism agendas to encourage local people to actively participate in the decision making process.

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